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STUDIES IN HIGH-SCHOOL PROCEDURE— HALF-LEARNING

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It is often said that we are a superficial people, good-natured, happy-go-lucky, more often concerned for speed and quantity than for quality. It is admitted that under stress we are capable of supremely good quality, but that upon the removal of the strain we relapse into our old ways. How far the indictment is a true bill it is no part of our present purpose to inquire. We resent the imputation when it is made by the citizen of other lands, but in our hearts most of us, I suspect, believe it in essentials to be true. At all events, the product of educational institutions is often roundly condemned for its half-learning. Few voices are raised in protest at such beratings, and our undoubted educational progress is not exactly in the direction of greater thoroughness. Perhaps we tacitly accept the situation as inevitable under the normal conditions of American life, and impute the slipshod character of so much of our learning to an inherent national vice. If so, our conclusion is a fine inversion of cause and effect.

We have had now considerably more than a generation of universal education, and universal education implies profound responsibilities as well as wonderful opportunities. So long as education reaches only the few, its social effect is by way of the slow infiltration of ideas and attitudes and practices. But the moment you put a whole generation to school, or even a substantial part of a whole generation, the social effect of mass education becomes direct and immediate. It requires twelve years to pass a body of pupils through the school system and perhaps ten years more before they begin to exert positive social influence; but there is a constant stream of this recruitment of the social mass going on. So it comes to pass that the common experiences which children undergo in school—and there is no such community of

experiences elsewhere in their lives—come to be very rapidly reflected in the characteristics of the society into which they are absorbed. And so it appears that if our common national life is in any way inclined to be superficial, the cause and the remedy must first be sought in the character of our schooling.

I wonder if we know how to be thorough in our school administration and teaching. May it not be true that some characteristic features of our school procedure lead inevitably to half-learning and a superficial outlook upon and attitude toward life? Surely, mere grinding drill does not constitute nor lead to thoroughness, nor can frequent adjurations to be thorough of themselves alone have any such happy result.

In a recent article¹ I discussed at some length the fallacies underlying our traditional lesson-learning and hearing conception of teaching. I cited illustrative evidence tending to show that lesson-learning is not transferable to the capacity with which the lesson is supposed to be correlated, except in a doubtful minority of cases, and that, the best scholars as identified by the marks awarded for good lessons are often very poor when rated by any valid test of achievement. More than that, perhaps as high as 75 per cent of our pupils never attain anything more than the capacity to get a lesson sufficiently well so that they are not required to get it again. All this is familiar ground to students of teaching.

Let us turn now from the teacher in the classroom to the theory upon which our various courses are set and administered.

The fallacy of the passing grade.—The American child commonly begins his systematic formal education with a first grade and he passes through six, seven, or eight grades which constitute what we call an elementary school. During his elementary-school career, he is “promoted” once a year, sometimes twice a year, rarely more often. He then enters upon a secondary and collegiate career during which “promotions” come to be called “passing courses.” He finally lands in a university or in active business or professional life in which he either succeeds or fails without much reference to the grade he has attained. Life has small patience

¹ “Studies in High-School Procedure—Direct and Indirect Teaching,” *School Review*, XXIX (January, 1921), 19–30.

with things half done. You can either do a thing or you can't. You may do better than your neighbor, you may do supremely well, but do you must.

When is a child "promoted" or a student "passed"? In general, when he has been faithful in learning a long series of lessons and passing a few examinations to the extent of 60 per cent, 70 per cent, 75 per cent of what he might have learned or passed. That is the theory. In practice, he is promoted or passed when his teacher finds no sure ground on which he can be kept back, and the pressure is always to promote. Seldom along the line is he subjected to a test of power acquired or of attainment in understanding, qualities trained into his mental make-up and as such his possession for all time. Let us consider for a moment what the process really means.

From about the third grade, the pupil may be thought of as passing from one teacher to another, from one college instructor to another, each of them presiding over one or more subjects or courses. The pupil is assigned his lessons with more or less positive instruction as he goes along through the grades and schools and courses. As he passes by, each teacher tags him with a grade or symbol, ultimately in numerical form, signifying the teacher's judgment as to what portion of the teaching and lesson-learning he has absorbed, or, more frequently, how faithfully he has prepared his lessons. In the end he is promoted or passed when the average of his "daily marks" consolidated with an examination grade, which usually bears heavy adverse weight, is equal to or above an arbitrarily selected percentage of what he would have had, had he really learned all his lessons. So on top of the fallacy of lesson-learning is imposed the further fallacy of a pass mark predicated on the principle that he has learned his lessons only to an extent ranging from 50 per cent to 100 per cent. Nay, more, the average mark assigned is a lenient one in most cases, and the pupil rarely learns his lesson to the extent indicated by his mark. In effect, the typical student or pupil always passes along with an achievement based on lesson-learning at about 85 per cent at best. In practice, the actual achievement on lesson-learning is much less than this; and, if actual usable capacity or achievement is the test,

as contrasted with fidelity in lesson-learning, the true passing mark of the typical student must be estimated at a very small fraction indeed. As we have seen, the achievement on lesson-learning can be rated the same as achievement in capacity in perhaps 25 per cent of the cases of individual students, certainly not more.

Now, the result manifestly is that the great majority—considerably more than 75 per cent of the whole—begin early in school life to accumulate deficiencies in capacity, so that each succeeding grade and course is harder to pass with full capacity. In the fifth and sixth grades a large number drop out of school because their accumulated incapacities have retarded them to the point where intellectual interest is absolutely dead and they reach the end of compulsory schooling. Others drop out for similar reasons until there is left to graduate chiefly the survivors who have been trained to become good lesson-learners. Naturally, half-learning on an immense scale is the result, and half-learning quickly reflects itself in the national character. Is it any wonder that our scholars so frequently deplore the dearth of productive scholarship in the arts and sciences when compared with our unrivaled material equipment? Productivity presumes actual trained capacity, not merely facility in lesson-learning. It further presumes 100 per cent capacity, not 70 per cent nor 80 per cent nor 90 per cent capacity.

In passing, we must discriminate between evil effects and good effects. I am talking here about intellectual values, not moral values. One may well raise the question, "Is this writer condemning fidelity in preparing lessons as a fallacy?" The answer is of course, "Not at all." Fidelity to duty is an excellent virtue, whatever the duty may be felt to be, and individuals who acquire the habit by doing their duty in the various situations set up by the school achieve a moral capacity which is beyond price. Only, in this case, it does not contribute heavily to intellectual values, and moral and intellectual values are not mutually exclusive. On the other hand, slipshod work—work half done—is a moral as well as an intellectual vice.

There is much reason to think that the graded system of school administration launched us on this half-learning career, and that

its implications have caught us in a net from which we struggle in vain to escape, scarcely knowing what holds us. Several recent inventions seem to the writer to be very materially tightening the net. Two of these I shall discuss.

The abuse of the probability curve.—I assume that my readers are familiar with the properties of the normal distribution surface and with their use in describing the manner in which all sorts of characteristics within the general field of the biological sciences tend to distribute themselves. These principles apply to the phenomena of school life as they apply to other phenomena which owe their origin to differences in human characteristics. Properly understood and evaluated, school achievements tend to distribute themselves in accordance with some orderly plan, which may, in truth, depart widely from the normal distribution of unselected data, but which still tends to exhibit itself as a symmetrical surface. But variations from the normal surface, as well as variations from any symmetrical surface, have in themselves a meaning which the administrator is bound to observe.

The device began to be widely used when it was found to be desirable to place some check upon the vagaries of different teachers in assigning marks and grades, and the principles of distribution then set up seem to have been founded on empirical data quite apart from the theory of the probability curve itself.

It was then easy for some administrators to fall into the habit of saying, "I shall have such and such a percentage of A's or 95's or what not, a similar percentage of failures, and a large number who will bear different grades betwixt and between." Such an attitude introduces much complacency into the school, to put it mildly. It will be true just because it ought not to be. A different attitude of the administration and of teachers toward teaching problems would disclose quite a different situation. Such a situation as that described is particularly vicious when it is found in connection with the ordinary numerical passing grade, which does not pretend to express mastery. If the passing grade discloses a genuine revelation of mastery, then the situation becomes quite different.

A teacher recently came to me toward the beginning of a course and remarked in distress that her distribution looked worse the better she taught and the better her results. I was able to comfort her with the assurance that her troublesome skews were creditable to her teaching, and they were. Assuming a teaching attitude which proposes to grapple with the individual problems of different students and which has mastery at the level of the grade or course as its objective—not a norm made up of median achievement of large numbers of pupils under teaching which is good, bad, and indifferent—the situation as the course goes on will be somewhat like this.

At the beginning, distribution of achievement will be nearly a vertical straight line, varying according to the initial achievement of students. If the subject is one, as most content subjects are, in which a good many students already have some knowledge, the distribution will probably be heavily skewed toward the lower end. Ideally, a subject might be chosen in which initial knowledge or achievement is an absolute blank. Then we have no distribution at all.

As work proceeds, distribution will tend at first to become broken up more or less, with more or less pronounced skews first one way and then the other. Before long, we shall have, under good teaching procedure *with constant attention to individual problems*, a distribution which tends to become symmetrical, which moves up along the base line, and which very probably has a disconnected bunch of unsolved individual problem cases toward the lower end. So far as teaching and the intellectual development of pupils alone are concerned, there is nothing to prevent this situation from being prolonged well-nigh indefinitely, but other considerations ordinarily intervene. For instance, pupils may be released as they approach mastery at their own grade level in spite of the fact that they might be capable of going on to higher levels. And so the mathematical character of distribution ceases to have any particular meaning.

So long, however, as the only use which the administrator makes of his distribution studies is in convincing himself that he

will always have, and ought to have, a certain proportion of failures, a large proportion of mediocrity, and a small proportion who really achieve what the course or school purports to teach—then such studies must operate as a particularly formidable instrumentality in settling upon the community half-learning as the normal and natural condition.

The fallacy of intelligence rating.—The second of the two recent additions to administrative equipment which I wish to discuss is the principle of intelligence rating as applied to the promotion and placing of pupils. Misunderstood, or half-understood, in its bearing upon school work and misapplied, it not only furthers the malady of half-learning, but sometimes sets up a pitiful piece of injustice which almost amounts to pedagogical malpractice.

In practice, the message to pupils and teachers alike runs something like this: this child is natively a near-genius, is probably destined to some great success in life, advance him rapidly; this one is natively dull, he will never come to anything much, and will never really learn; these are the common run of humanity, teach them what you can, they won't learn much anyway. Now, nothing of the sort is true and herein lie the fallacy and the injustice.

The rating of relative intelligence has undoubtedly passed beyond the stage of mere psychological venture. Beyond any reasonable question, the ratings obtained correspond to real differences in individual native capacities. Conservative psychologists are reluctant to say just what these real differences are, and much less are they ready to use the ratings as determinative of the individual's capacity. They are useful within their limitations and useful when properly understood and applied. They are particularly valuable for diagnostic purposes in identifying mental defect, but even here the careful psychopathologist will not render a verdict of feeble-mindedness without corroborative evidence drawn from the individual and family history and from other sources. But mental defect is a pathologic condition. The evidence seems to show that it is not merely one term of a gradation of intelligence of which genius is the opposite.

But, conceding that intelligence rating is a perfectly valid psychological procedure, and conceding further that it corresponds

closely to opinions of relative intelligence as formed by teachers and others, what is its bearing upon school work and progress?

Fundamentally, in the intellectual life the individual must learn, be he never so clever, never so dull. No child ever yet could read, or cipher, or translate Latin, or understand a principle of physics, unless he first learned to do so. Mentality and intellectual achievement are not synonymous, nor is mentality translatable into intellectuality. It does not follow that because a child is bright he has therefore achieved. He may achieve more easily than the dull, but achieve he must.

Indeed, in any correct use of terms and language, the dull may come to be more intelligent than the bright. Though there is little or no evidence that native mentality is affected by learning, it is obvious that the ability of an individual to react to the complex situations of the modern world may be greatly affected by learning. Indeed, one can but think that the term "intelligence tests" was most unfortunately chosen. "Mentality tests" would have been better. Intelligence implies knowledge; mentality does not. Conceive two individuals, one with a valid I.Q. of 100 and the other with an equally valid I.Q. of 140. Send No. 1 to school and college under good and competent guides and teachers and No. 2 to a remote wilderness without schooling from childhood. Give them equally good bodily health and development. Bring them to a metropolitan city at full maturity. Obviously, No. 1 will classify as the normal educated man, probably successful in the ordinary concerns of life. No. 2 will be so helpless as to qualify as feeble-minded on the sociological definition. One has learned, the other has not. And yet their respective mentality indices will probably not have greatly changed, so far as we can judge from evidence now available. This extreme, imaginary case is an entirely valid illustration of the relations between mentality and intelligence for all grades between positive feeble-mindedness and genius, between complete ignorance and sound general education.

Nevertheless, in a graded system of schools a child is frequently promoted, not because he has attained the understanding and powers contemplated by the grade, but because his mentality is shown to be of the order of the next higher grade. He does the

work of the higher grade because he is clever, and being such is adaptable, but his intellectual equipment is lacking in some degree because he has missed some of its essential items. He goes on to high school and eventually reaches the university gates. All along the line he is again and again classified wholly or in part on the basis of native mentality. Again and again, he omits items of intellectual equipment which even the bright must learn. In the end, half-learning has another brilliant exponent.

So far the case seems to be clear as argued from the basis of the accepted nature of mentality as rated by the mentality tests. The tests are valid but their application fallacious.

A great mass of material is in evidence tending to show a high correlation between mentality ratings and school ratings. Two comments are in order in passing.

First, the correlation must not only be high but practically complète before we are justified in using the mentality ratings as a basis for classification without elaborate corroborative evidence. Otherwise, how shall we ever know in the case of any individual whomsoever that he is not one of the individuals whose cases make the correlation incomplete?

Further, in most of the material thus far gathered from schools, comparison is made between mentality ratings and grades which have been awarded on the basis of lesson-learning rather than on the basis of achievement. The bright pupil is at a great advantage in lesson-learning, but even here it by no means follows that correlation is of the type required by school practice.

The following summary of evidence gathered in our laboratory during the past year is contributed.

One hundred and twenty-two pupils were given achievement tests ranging from second-grade reading to high-school mathematics. Their I.Q.'s on tests were known. The pupils were distributed in order of achievement and their I.Q.'s were taken from highest to lowest. Comparison was then made between standings in the two columns. It was found that 110 of the 122 were displaced from the positions which they would have occupied on the expectation of high correlation between the two ranks, some of them more and some of them less, *but 33 were greatly displaced.*

In a similar manner, grades in final examination were compared with the corresponding I.Q.'s. Now, results on final examination are in part the reflection of achievement—to a much greater extent than those assigned for daily recitation—and in part the product of lesson-learning. We have seen in a former article reason to think that final examination grades are not in close correlation with results in achievement tests. On these examination comparisons, 100 individuals were studied, for all of whom the I.Q. was available. Eighty-six of these were more or less displaced from the position which a high correlation would have presumed, and 24 were greatly displaced.

Not much importance in either this or in the preceding set of results is attached to the displacements recorded in the larger figures. Still, the effect upon the general theory is not immaterial. Of the 86 cases of displacement on the final examination comparison 50 were displaced by as much as a quartile and a similar proportion in the achievement tests. The really significant thing, however, is found in the fact that, while we frequently find the highest I.Q. standing No. 1 or No. 2 on the achievement or examination scale, we find nearly as often No. 1 standing halfway down the achievement scale and high I.Q.'s standing at the bottom of the scale. Conversely, we find numerous instances of the lowest I.Q.'s standing at the top—in the first quartile or quintile. In one case we have a 96 standing No. 2.

It is the old, old story: "The race is not to the swift." These high I.Q.'s are correctly measured. They really are bright and clever children, but they have not thoroughly grasped principles, acquired powers, and they suffer by comparison with relatively dull children who have done so.

The objection may be made that we are not taking into account here the principle that the I.Q. expresses a relation between brightness and chronological age and that we have treated the problem without due reference to the age factor which enters the I.Q. The objection is not material to our main contention, which is that mental maturity is not translatable into intellectual maturity.

It is true that if we make an age-grade table of I.Q.'s, the regularity with which the high I.Q.'s appear in the higher grade

for the same age is striking. But even here when we scrutinize closely the individual cases the regularity is not so impressive. I have before me the I.Q.'s of 311 elementary and kindergarten children distributed in an age-grade table. The characteristic noted above is apparent, but, on examining in detail the distribution of individuals, we find 157 cases in which the I.Q. is either higher than the median of the next higher or lower than the median of the next lower half-grade; 44 cases in which it is either higher than the median of the next full grade or lower than the median of the next lower; and 14 cases in which it is either higher than the highest or lower than the lowest of the next half-year.

It is important to note that the administration of our elementary school does not promote on the basis of the I.Q.

It appears, then, that the current tendency to confound mentality and intellectual achievement must inevitably have a strong tendency toward the encouragement of half-learning. Not only must it emphasize the importance of mere brightness to the encouragement of shallowness, but it must also result in serious gaps in the pupil's intellectual equipment, through ill-advised "promotions." More than that, it tends to bring about a cruel injustice to the plodding pupil of solid rather than brilliant parts when the whole atmosphere of a school, which is under the obsession of "intelligence testing," tends to persuade him that his case is hopeless, that he was born to linger behind his brilliant but often superficial contemporaries. As well introduce hereditary aristocracy into our schools and be done with it.

The fallacy of time to be spent and ground to be covered.—You must study a subject for four, or it may be five, hours a week for a minimum of perhaps 36 weeks in the year and continue to do so for one, two, three, or, in extreme cases, four years. During that time you must cover such and such ground. You must be credited by your teacher with having learned 70 per cent, or 60 per cent, or some other per cent of your lessons. What you know, what you can do, doesn't matter. So runs the typical basis of practical educational achievement. Again our old friend, the graded system, with its fair progeny of mechanical devices in administration. How else can we "administer?" You see the deeper we go the more

hopelessly we become entangled in the meshes of half-learning or no learning. The more our attention becomes engrossed with the machinery, the less regard we have for our ultimate purpose. We began with the pedagogic fallacy of lesson-learning, crowned with the honors of hoary tradition, and we have reached the logical and legitimate end of the series in this *reductio ad absurdum*, educational credit for time spent and ground covered. Thereon hang all the possibilities of higher education.

If we were to canvass the inner consciousness of teachers in the United States, I venture to say we should find that the form in which pedagogical and educational responsibility expresses itself in 90 per cent of the cases is the question, Can I cover this ground in the time allowed? And so children are hurried and held back. Administrative devices are multiplied with the purpose of enabling teachers to cover ground in assigned time more easily and with a larger percentage of promotions. Children are fitted into this grade and refitted into that. The curriculum is scrutinized, measured, adjusted, cut down—all for the purpose of making the machine run more smoothly.

Now, there is not a subject taught, worth teaching at all, in which the central and vital thing is not either a definite *body of principles to be understood* or a definite *power to be gained*. The ground to be covered is commonly a body of material valuable solely as assimilative material in the process of understanding or in the process of gaining power. The assumption is that having covered the ground the pupil will have acquired the understanding or the power, or both. Herein lies the fallacy, for obviously the actual achievement will occur as it may happen in the cases of individuals, or not at all. To cover a thousand pages of French in daily assignments, or to read a given number of books of Caesar or Virgil, is no guaranty whatever that the pupil will afterward know how to read French or to translate Latin. A few simple but appropriate tests will soon convince the investigator that in the vast majority of cases the pupil can do neither, albeit he may have spent three or four years in covering the ground and have won a commendable 85 or B or A as the case may be. In the end, the result is half-learning or no learning at all.

Sometimes, as in the case of algebra, the objective is rationally stated in the form of a certain number of processes to be mastered, but it is so submerged under the dominance of the notion that it must be done in a year or that a year must be spent in doing it, and under the further dominance of the lesson-hearing fallacy, that the result in the end is commonly half-learning.

The requirement is sometimes varied, as in the case of science, by substituting for the ground-to-be-covered fallacy a variant in the form of a method-to-be-used and a time-to-be-spent type of procedure. In physics, for instance, the authorities are satisfied that, if a certain ground will be covered and a laboratory notebook presented and that a year will be spent on the course and a passing mark attained, an understanding of the principles of physics will be the result. Obviously, no such conclusion can be justified.

If the reader has followed me so far, I ask him to turn back over the list of fallacies which we have been discussing and note that our whole process of administration tends to be a thing apart from teaching and learning. Our administrative procedure constantly tends to deal with its problems, not in terms of teaching and learning, but in terms of abstractions entirely apart from these processes for which schools exist. Administration notes that certain quantities called marks and grades come to its desk at regular intervals. It is at once interested and observes that certain fascinating things can be done with these marks and grades. And it does things, entirely apart from any consciousness as to how these quantities came to be or whether they ought to be at all. Administrative literature is full of studies which discover interesting properties in these things as pure abstractions. Students qualify as experts in administration whose knowledge of the teaching process and the learning process is either a purely naïve matter or is non-existent altogether. A large part of secondary and collegiate administration is based on this purely abstract kind of study and procedure. And yet in the end school administration is primarily administration of the teaching process and the learning process, and the qualified administrator must be a good teacher and a good psychologist and a good student of individual development long before he becomes a student of administrative devices.